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(21) International Application Number: PCT/US99/13550 (22) International Filing Date: 16 June 1999 (16.06.99) (30) Priority Data: 60/089,750 18 June 1998 (18.06.98) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 60/089,750 (CIP) Filed on 18 June 1998 (18.06.98) (71) Applicant (for all designated States except US): CLARITY, LLC [US/US]; Suite 200, 206 South Fifth Avenue, Ann Arbor, MI 48104 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): ERTEN, Gamze [US/US]; 1848 Elk Lane, Okemos, MI 48864 (US). SALAM, Fathi, M. [US/US]; 1848 Elk Lane, Okemos, MI 48864 (US). (74) Agent: SU, Jintung; Wilson Sonsini Goodrich & Rosati, 650 Page Mill Road, Palo Alto, CA 94304-1050 (US).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published With international search report.
(54) Title: ADAPTIVE STATE SPACE SIGNAL SEPARATION, DISCRIMINATION AND RECOVERY ARCHITECTURES AND THEIR ADAPTATIONS FOR USE IN DYNAMIC ENVIRONMENTS		
(57) Abstract This invention unifies a set of statistical signal processing, neuromorphic systems, and microelectronic implementation techniques for blind separation and recovery of mixed signals. A set of architectures, frameworks, algorithms, and devices for separating, discriminating, and recovering original signal sources by processing a set of received mixtures and functions of said signals are described. The adaptation inherent in the referenced architectures, frameworks, algorithms, and devices is based on processing of the received, measured, recorded or otherwise stored signals or functions thereof. There are multiple criteria that can be used alone or in conjunction with other criteria for achieving the separation and recovery of the original signal content from the signal mixtures. The composition adopts both discrete-time and continuous-time formulations with a view towards implementations in the digital as well as the analog domains of microelectronic circuits. This invention focuses on the development and formulation of dynamic architectures with adaptive update laws for multi-source blind signal separation/recovery. The system of the invention seeks to permit the adaptive blind separation and recovery of several unknown signals mixed together in changing interference environments with very minimal assumption on the original signals. The system of this invention has practical applications to non-multiplexed media sharing, adaptive interferer rejection, acoustic sensors, acoustic diagnostics, medical diagnostics and instrumentation, speech, voice, language recognition and processing, wired and wireless modulated communication signal receivers, and cellular communications. This invention also introduces a set of update laws and links minimization of mutual information and the information maximization of the output entropy function of a nonlinear neural network, specifically in relation to techniques for blind separation, discrimination and recovery of mixed signals. The system of the invention seeks to permit the adaptive blind separation and recovery of several unknown signals mixed together in changing interference environments with very minimal assumption on the original signals.		

